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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,465	09/29/2003	Alex S. Goldenberg	IMMR073/02US	7950

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EXAMINER	
MOON, SEOKYUN	
ART UNIT	**PAPER NUMBER**
2629	

DATE MAILED: 07/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/671,465	GOLDENBERG ET AL.
	Examiner	Art Unit
	Seokyun Moon	2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 29 September 2003.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-32 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-3,6-24 and 26-28 is/are rejected.

7)☒ Claim(s) 4,5,25 and 29-32 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 29 September 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 1/9/04&8/3/04.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statements (IDS) filed on January 9, 2004 and August 3, 2004 have been acknowledged and considered by the examiner. The Initial copies of Form PTO-1449 are included in this office action.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 1-3**, **6**, **8-17**, **19-22**, and **26-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogata et al. (US. 6,171,191 B1, herein after referred to as "Ogata") in view of Furuki (US. 6,268,671 B1).

As to **claim 1**, Ogata teaches a method, comprising:

receiving information ("*execution of a game with a good simulated presence feeling*") associated with an application ("*game*") [col. 2 lines 11-18];

determining a control signal ("*command signal*") based on the information, the control signal configured to drive an actuator ("*vibration motor 101*") having a rotatable mass ("*rotor 111*") such that the mass rotates to produce a vibration [col. 13 lines 29-43 and col. 15 line 66 – col. 16 line 3] [fig. 20].

Ogata does not expressly teach a control signal being period and being sent to an actuator to produce a vibration having a magnitude and a frequency, the magnitude of the vibration being based on a duty cycle of the control signal and independent of the frequency of the vibration.

However, Furuki [fig. 4] teaches a vibrating generation apparatus for a game machine operating unit [col. 1 lines 6-7] having a periodic control signal sent to an actuator to produce a vibration having a magnitude and a frequency, the magnitude ("*amplitude*") of the vibration being based on a duty cycle of the control signal and independent of the frequency of the vibration [col. 6 lines 1-6].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ogata's control signal to be periodic and to produce a vibration having a magnitude and a frequency which are independently controlled based on the duty cycle and the frequency of the control signal, as taught by Furuki, in order to provide various modes of vibration involving shocks [Furuki: col. 1 lines 33-37].

As to **claim 2**, Ogata modified by Furuki [Furuki: fig. 4] teaches the control signal having at least one of an on time and an off time, the on-time of the control signal (which is determined by "*duty ratio*" of the control signal) being associated with the magnitude of the vibration [Furuki: col. 6 lines 1-6].

As to **claim 3**, Ogata modified by Furuki [Furuki: fig. 4] teaches the control signal having at least one of an on time and an off time, the on-time of the control signal is associated with a percentage of a period of the vibration (when the magnitude of the control signal is "A" as shown in fig. 4, vibration occurs while vibration stops when the

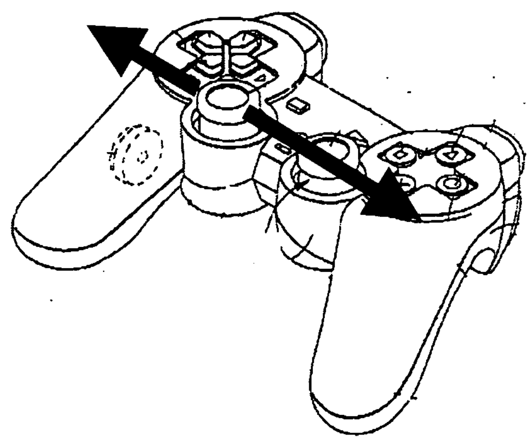
magnitude of the control signal is 0. This indicates that vibration occurs only when the control signal is on, which implies that the on-time of the control signal is proportional to the percentage of a period of the vibration).

Furthermore, Ogata modified by Furuki teaches the percentage being proportional to a desired magnitude of the vibration since the percentage of a period of vibration is proportional to the on-time of the control signal which is equivalent to duty ratio of the control signal as discussed with respect to the rejection of claim 2.

As to **claim 6**, Ogata [*fig. 1*] teaches the actuator ("*vibration motor 101*") being disposed within a game-pad controller, the application ("*game program*") associated with a host microprocessor of a host computer ("*game machine comprising a disc driving unit, a picture processor, and a control unit*") [col. 1 lines 19-24 and col. 2 lines 21-25], the vibration is correlated with at least an event and an interaction ("*simulated presence feeling*") occurring within a graphical environment of the application [col. 2 lines 11-18].

As to **claims 8**, **9**, and **10**, Ogata teaches the information (execution of "*a good simulated presence feeling*" for a game application) [col. 2 lines 11-18] being associated with a kinesthetic effect (the rotation of Ogata's rotatable mass with an angular velocity, which causes a kinesthetic effect) [col. 13 lines 29-43], the method further comprising mapping from the kinesthetic effect to a vibrotactile effect (determination of the angular velocity of the rotatable mass depending on the degree of the vibration) based on the information to produce the control signal ("*command signal*") [col. 15 line 66 – col. 16 line 3], the actuator ("*vibration motor 101*") being disposed within a haptic feedback

device ("*actuating device 1*") having a local microprocessor ("*CPU*") [fig. 25], the mapping being performed by the local microprocessor (the "*CPU*" determines the signal to drive the actuating device including a vibration motor based on the degree of the vibration required / preferred for the game application), the gamepad controller including a joystick having two degrees of freedom [drawing 1 provided below] and configured to provide input to the host computer ("*main body unit*") when manipulated [fig. 27] [col. 2 lines 21-25].



Drawing 1

As to **claim 11**, Ogata [fig. 20] teaches the method comprising sending an initial control signal to the actuator ("*vibration motor 101*"), the mass ("*rotor 111*" included in the "*motor 101*") initiating rotation before initiation of the vibration [col. 12 lines 53-57].

As to **claim 12**, Ogata does not expressly teach a haptic feedback device including a plurality of actuators collectively producing the vibration.

However, the courts have held that "a mere duplication of the components of the device is generally recognized as being within the level of ordinary skill in the art". St. Regis Paper Co. v. Bemis Co. Inc. *193 USPQ 8, 11 (7TH Cir. 1977).*

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include plural actuators in a haptic feedback device rather than including just one actuator, in order to produce higher degree of vibration thus to provide better simulated presence feeling.

As to **claim 13**, Ogata modified by Furuki teaches the control signal being modified by envelope parameters ("*duty ratio of the drive current*") received from a host computer, the envelope parameters modifying the magnitude of the vibration [Furuki: col. 6 lines 1-6].

As to **claims 14** and **15**, Ogata modified by Furuki teaches that the information includes a high level command and at least one parameter, the high level command is a vibration command, the at least one parameter includes a magnitude parameter (Furuki: "*duty ratio*" of the control signal) and a frequency (Furuki: "*frequency*" of the control signal) parameter associated with the vibration [Furuki: col. 6 lines 1-6], the actuator (Ogata: "*vibration motor 101*") being disposed within a vibrotactile interface device [Ogata: fig. 22] having a local microprocessor separate from a host microprocessor configured to parse the high level command (Ogata: "*CPU*") [Ogata: figs. 25 and 26] [col. 15 line 66 – col. 16 line 3].

As to **claim 16**, Ogata modified by Furuki teaches an apparatus [Ogata: fig. 1], comprising:

a housing;

an actuator (Ogata: "*vibration motor 101*") coupled to the housing and including an eccentric mass (Ogata: "*rotor 111*") coupled to a rotatable shaft (Ogata: "*driving shaft*

109") of the actuator defining an axis of rotation [Ogata: fig. 20] [Ogata: col. 13 lines 29-43]; and

a circuit (Ogata: a combination of *"PIO"*, "*CPU*", "*RAM*", "*ROM*", and "*SIO*") [Ogata: fig. 25] coupled to the actuator [Ogata: col. 14 lines 1-5], the circuit configured to produce a control signal such that, when the control signal is received by the actuator, the actuator induces a vibration having a magnitude and a frequency by rotating the mass about the axis of rotation [Ogata: col. 13 lines 29-43], the magnitude of the vibration being based on a duty cycle of the control signal and being independent of the frequency of the vibration [Furuki: col. 6 lines 1-6].

As to **claim 17**, Ogata teaches the circuit including a local microprocessor ("*CPU*") configured to receive from a host microprocessor ("*main body unit*") information associated with an application [fig. 25], the control signal ("*command signal*") being produced based on the information, the local microprocessor configured to output the control signal to the actuator ("*vibration motor 101*") [col. 14 line 54 – col. 16 line 3].

As to **claim 19**, all of the claim limitations have already been discussed with respect to the rejection of claims 16 and 17 except for the local microprocessor configured to determine when the vibrotactile sensations are to be outputted.

Ogata teaches the local processor ("*CPU*") configured to determine when the vibrotactile sensations are to be outputted based on events occurring within a graphical environment associated with the host microprocessor ("*main body portion 131*") [fig. 26] [col. 2 lines 1-18 and col. 15 line 66 – col. 16 line 3].

As to **claim 20**, all of the claim limitations have already been discussed with respect to the rejection of claims 10 and 19.

As to **claim 21**, all of the claim limitations have already been discussed with respect to the rejection of claims 1 and 12.

As to **claim 22**, Ogata [fig. 25] teaches the actuator ("*vibration motor 101*") being configured to receive power over an interface bus ("*power source cable 152*" which is a bidirectional serial communication, which is accomplished by a bus connection) connecting the circuit (a combination of "*PIO*", "*CPU*", "*RAM*", "*ROM*", and "*SIO*") to a host microprocessor ("*main body portion 131*") [col. 15 lines 13-21].

As to **claim 26**, all of the claim limitations have already been discussed with respect to the rejection of claim 10 except for receiving a command associated with a kinesthetic haptic effect.

Ogata teaches receiving a command associated with a kinesthetic haptic effect, the kinesthetic haptic effect (rotation of the Ogata's vibration motor 101) being associated with kinesthetic forces (the angular force generated by the rotation of the motor).

As to **claim 27**, Ogata as modified by Furuki teaches the kinesthetic haptic effect (the rotation of Ogata's rotatable mass with an angular velocity, which causes a kinesthetic effect, which is driven by a control current) [Ogata: col. 13 lines 29-43] being a periodic effect [Furuki: fig. 4] having a magnitude (the duty ratio of driving Ogata's motor with a driving current) and a frequency (the frequency of driving Ogata's motor), the vibrotactile haptic effect having its own magnitude and frequency, the magnitude

and the frequency of the vibrotactile haptic effect corresponding to the magnitude and the frequency of the kinesthetic haptic effect, respectively [Furuki: col. 1 lines 33-37].

As to **claim 28**, Ogata teaches the method comprising providing a control signal (*"command signal"*) to an actuator (*"vibration motor 101"*) of the vibrotactile interface device based on the vibrotactile haptic effect [fig. 26].

4. **Claims 7** and **18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogata and Furuki as applied to claims 1-3, 6, 8-17, 19-22, and 26-28 above, and further in view of Rosenberg et al. (U.S. Pat. No. 5,739,811, herein after referred to as "Rosenberg").

As to **claim 7**, Ogata modified by Furuki does not teach a method of monitoring a position of the mass about the axis of rotation so that the mass rotates in response to the control signal.

However, Rosenberg teaches a method of sensing a position of an object along the degree of freedom and adjusting the control signal applied to the object depending on the detected / sensed position, included in a user interface device [col. 3 lines 37-60].

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement Rosenberg's sensor in Ogata detecting the position of Ogata's rotor and to adjust the behavior of Ogata's rotor based on the information detected by the sensor, as taught by Rosenberg, in order to provide a more realistic and accurate feedback for the control device [col. 3 lines 9-11].

As to **claim 18**, Ogata as modified by Rosenberg [Rosenberg: fig. 1] as discussed with respect to the rejection of claim 17 teaches a sensor (Rosenberg: "*sensor 28*") configured to determine a position of the mass (Ogata: "*rotor 111*") in a rotational degree of freedom.

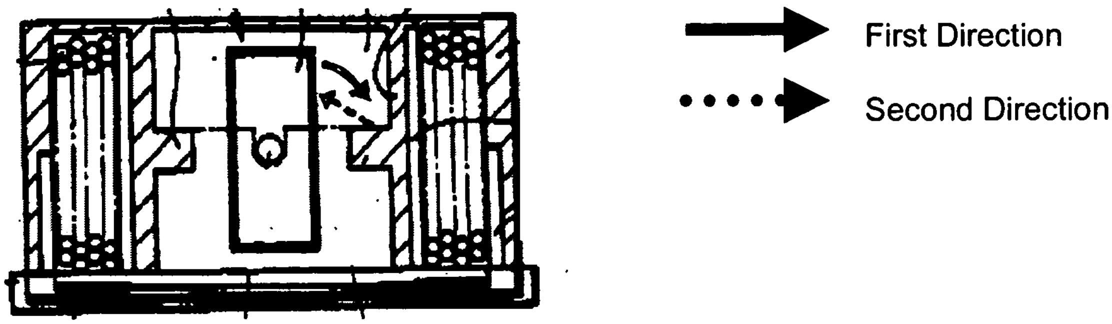
5. **Claims 23** and **24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogata and Furuki as applied to claims 1-3, 6, 8-17, 19-22, and 26-28 above, and further in view of You et al. (US Pat. No. 5,668,423, herein after referred to as "Dong").

As to **claim 23**, Ogata does not teach an obstacle member disposed within the housing.

However, Dong [fig. 4] teaches an apparatus comprising:

an obstacle member ("*projecting part 19A* and *19B*") disposed within the housing, the obstacle member defining an end portion of a range of motion of the mass, the circuit configured to drive the mass in a first direction, the obstacle member configured to move the mass in a second direction opposite the first direction [drawing 2 provided below] when the mass impacts the obstacle member, the vibration being based on the control signal and at least in part by the mass impacting the obstacle member [col. 4 line 61 – col. 5 line 7].

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the structure of the vibration generating device included in Ogata's actuator with Dong's vibration generating means in order to provide a method of generating vibration while maintaining the balance of the rotation within the rotation axis.



Drawing 2

As to **claim 24**, Ogata modified by Dong teaches the obstacle member is a hard stop (preventing the rotation of the rotor by providing a force with the opposite direction of the rotation).

Allowable Subject Matter

6. **Claims 4**, **5**, **25**, and **29-32** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seokyun Moon whose telephone number is (571) 272-5552. The examiner can normally be reached on Mon - Fri (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

July 6, 2006
S.M.

AMR A. AWAD
PRIMARY EXAMINER

Amr Ahmed Awad